LAYER-THICKNESS DETECTION METHODS AND
APPARATUS FOR WAFERS AND THE LIKE, AND
POLISHING APPARATUS COMPRISING SAME

5   Abstract of the Disclosure

        Methods and apparatus are disclosed for detecting a thickness of a
surficial layer (e.g., metal or insulating layer) on a workpiece (e.g.,
semiconductor wafer) during a process for planarizing the layer, so as to
stop the process when a suitable process endpoint is reached. Layer
10   thickness is detected based on a spectral-characteristic signal of
reflected or transmitted signal light, obtained by directing a probe light
onto the surface of the workpiece. Example spectral characteristics are
local maxima and minima of signal-light waveform, differences or
quotients of the same, a dispersion of the signal-light waveform, a
15   component of a Fourier transform of the signal waveform, a cross-
correlation function of the signal waveform. Alternatively, the zeroth
order of signal light is selected for measurement, or a spatial coherence
length of the probe light is compared with the degree of fineness of the
pattern on the surface illuminated with the probe light. An optical model
20   can be determined based on the comparison, and at least one of the layer
thickness and the process endpoint is detected by comparing the
measured signal-light intensity with the calculated theoretical signal light
intensity.